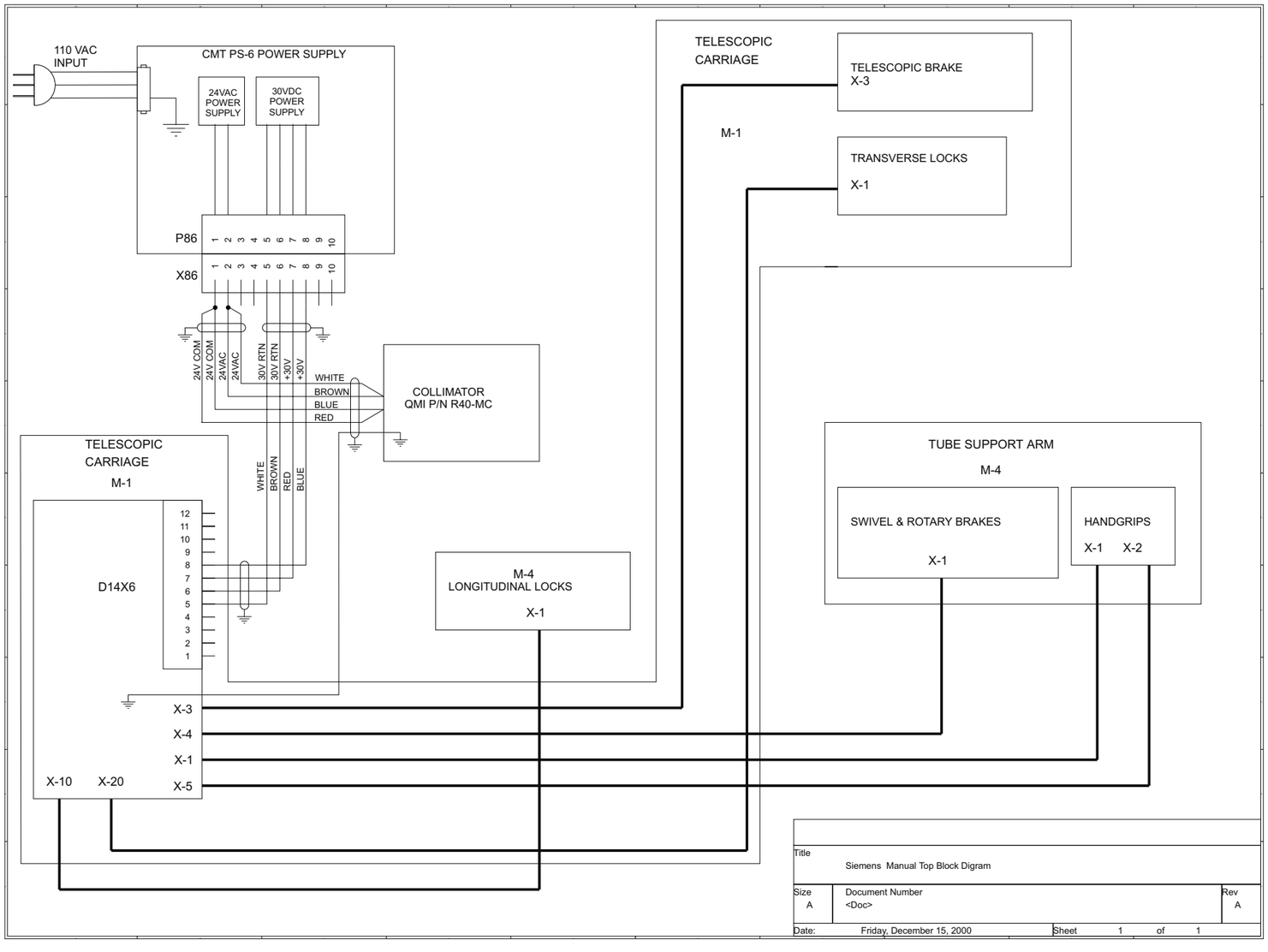
Section 3

Quantum Medical Imaging CMT RS-580- Interconnection Diagram

WIRING DIAGRAM FOR QUANTUM CMT TUBECRANE (MODIFIED SIEMENS 3D TOP CEILING STAND)



Title	Siemens Manual Top Block Digram	
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Date: Friday, December 15, 2000	Sheet 1 of 1	

Section 4

MULTIX TOP manual Startup Instructions

SIEMENS

MULTIX TOP manual

AX

Installation

Startup Instructions

For MULTIX TOP manual; System without Processor

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Manufacturer's Note

The document was originally published in German.

Safety Information

CAUTION	**While carrying out all work steps and checks, the product-specific safety notes contained in the instructions, as well as the general safety notes must be observed.**

NOTICE	**The pink dust protective covers are also used for ESD protection! They may be removed only if the cabinet / the unit must be opened.**

Protection against Laser Radiation

- This system contains a Class 2 laser.
- When working on the laser light localizer, do not look directly into the laser beam.
- See also ARTD, Part 2 "Laser Radiation".

Tolerances

General tolerances for linear dimensions per ISO 2768

Tolerance limit for nominal dimension range	over 3 mm to 6 mm	over 6 mm to 30 mm	over 30 mm to 120 mm	over 120 mm to 400 mm	over 400 mm to 1000 mm	over 1000 mm to 2000 mm	over 2000 mm to 4000 mm
Admissible tolerance	± **0.5 mm**	± **1 mm**	± **1.5 mm**	± **2.5 mm**	± **4 mm**	± **6 mm**	± **8 mm**

These tolerances apply for all dimensions listed in these instructions, as long as no other value is expressly listed behind the value.

A tolerance of ±10% is permitted for torque values.

Required Documents

- MULTIX PRO/TOP Test Certificate
- MULTIX PRO/TOP Installation Certificate RXB1-140.039.01...
- Test Certificate for Direct Exposure Equipment RXD0-000.037.05...

Required Test Equipment, Tools and Aids

NOTICE	**All tools, measuring instruments and aids are listed and specified in the Service Tools Catalogue, with the exception of the "standard installation tools".**

- Standard installation tool kit
- Spring balance, 200 N — 44 15 113 RH090
- Spring balance,100 N — 44 29 122 RH090
- ESD equipment, Type 8501 - 3M — 97 02 606 Y3121
- Digital multimeter e.g.: Fluke 8060 A — 97 02 101 Y4290
- kV measuring chamber — 96 60 754 RE999
- Memory oscilloscope, Fluke 3390A — 99 00 861 RE999
- Ground wire test instrument — 44 15 899 RV090
- Loctite 221 — 20 48 874 RV090
- Torque wrench, 1/4" (3-20 Nm) — 34 24 553

Text Emphasis

⚠WARNING	**All texts labeled with "WARNING" call attention to potential risks to health or life.**

CAUTION	**All texts labeled with “CAUTION” contain information about dangerous situations and measures to avoid risk.**

NOTICE	**All texts labeled with “NOTICE” contain additional information regarding the work routine which follows and which is provided for a better understanding or as a warning about unnecessary and avoidable difficulties.**

All texts labeled with the ”⋘ ” symbol in the supplied MULTIX TOP Test Certificate or in the Test Certificate for Direct Exposure Equipment can be transcribed (the Test Certificate is located in Register 9 of the Subsystem Binder).
These measurement values can thus be transcribed for the Acceptance Test required in Germany per the Röntgenverordnung §16 or for other national regulations.

Important Remarks Regarding Startup

NOTICE

Completing protocols:

- **Pencil may not be used.**
- **Do not make corrections using Tippex; they should be handwritten.**
- **Draw a line through the incorrect value, enter the new value and enter your initials and the date.**
- **Fields in which no entry is made should be completed with, n.a. (not applicable).**
- **Protocols must be completed, signed and dated by the technician after completing the startup.**
- **File all protocols in Register 9 of the Subsystem Binder.**

CAUTION

Checks or adjustments which need to be made with radiation switched on are labeled with the radiation warning symbol ☢.

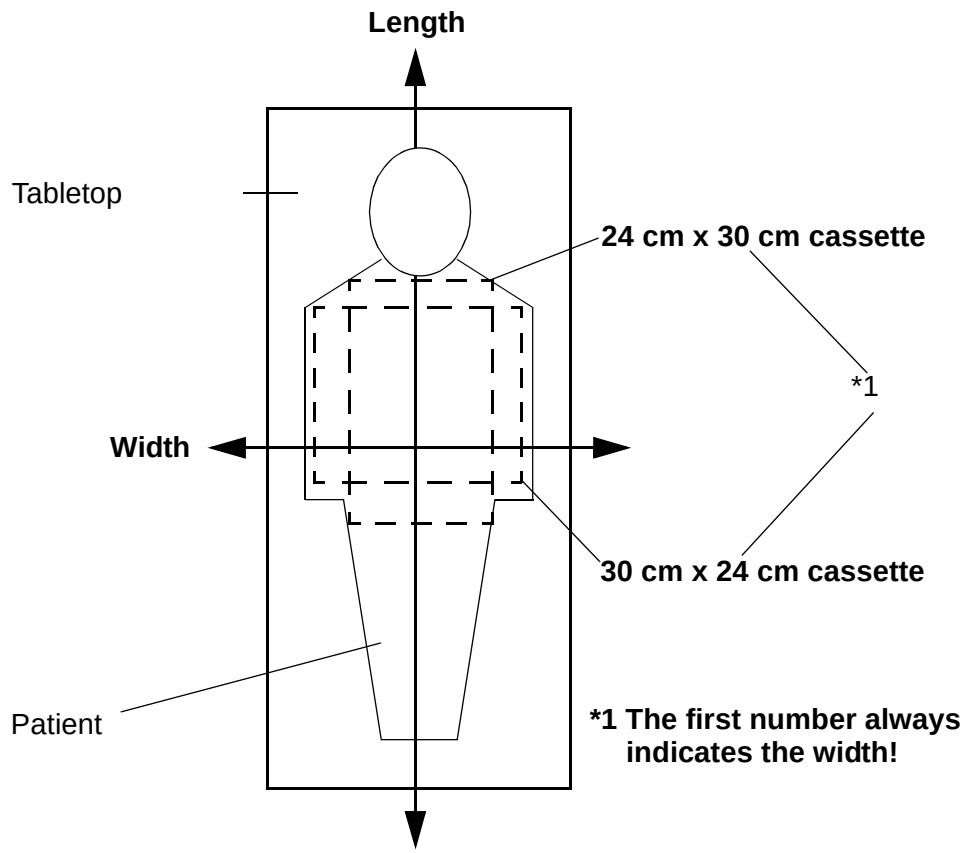
While performing adjustments labeled this way, radiation protective clothing must be worn.

Abbreviations Used

SID = Source-to-image distance
DVM = Digital voltmeter
DHA = Rotation around the horizontal axis
DVA = Rotation around the vertical axis
SSW = Service software

Definition of Terms for Cassettes and Radiation

The terms **"length"** and **"width"** used, as well as inserting cassettes should be understood as shown in the sketch:



Special Symbols

- Symbol for working with radiation
- Symbol for working with dangerous voltage
- Symbol for tolerance value
- Symbol for working with laser radiation

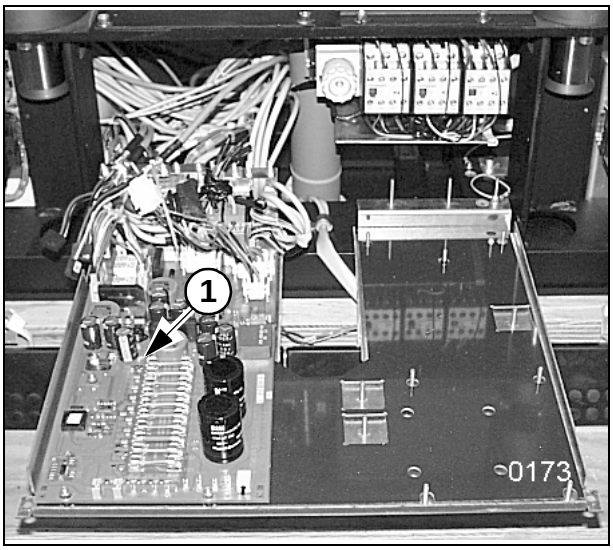


Fig. 1

Remark

The line power which was used to test the MULTIX TOP System can be found in the Test Certificate. The standard connection is 2-phase, 400V, 50/60 Hz. If an adaptation to the local line power must be made, proceed in accordance with the points marked with an asterisk (*) in the System Wiring Diagrams (MULTIX TOP Wiring Diagram G050G, Page 2E). The test certificates are filed in Register 9 of the Subsystem Binder.

NOTICE	**Before switching on the system, it is absolutely necessary to check the line power setting.**

Checking the Operating Voltage

- Switch on the system at the generator.
  - The following LED's on the table backplane board must go on:
    v10, v11, v13, v14-v18, v20,v22, v23 (1/Fig. 1); MULTIX TOP Wiring Diagram G050G, Page 30A.

Generator Startup

NOTICE

The MULTIX TOP is shipped out as a subsystem. In other words, the tube assembly installed on the MULTIX was <u>not</u> tested with the system. The tube assembly must be started up along with the generator.

NOTICE

With a KK connection of 2 workstations to the POLYDOROS LX 30/50/80, SX 65/80 generator, adapt the special cable (kk1b G1/G2) for the 2nd workstation as follows. Push out Pin 16 in the kk1b G1/G2 cable connector on the generator side and insulate it.

- The generator should now be started up using the supplied startup instructions

POLYDOROS SX 65/80, LX 30/50 Lite, LX 80	RX63-020.034.18...
System Configuration with the Service PC for POLYDOROS LX 30/50, POLYDOROS LX 30/50 Lite and POLYDOROS SX 65/80, POLYDOROS LX 80	RX63-020.034.21...

  in the following sequence:

  1. per Chapter 1: "Requirements"
  2. per Chapter 2: "Startup without High Voltage"
  3. per Chapter 3: "Startup with High Voltage".

- Older generators (24 V KK connection) should be started up in accordance with the documents found on site and in the same sequence.
- After the generator startup has been completed, continue with Chapter 3 of these instructions.

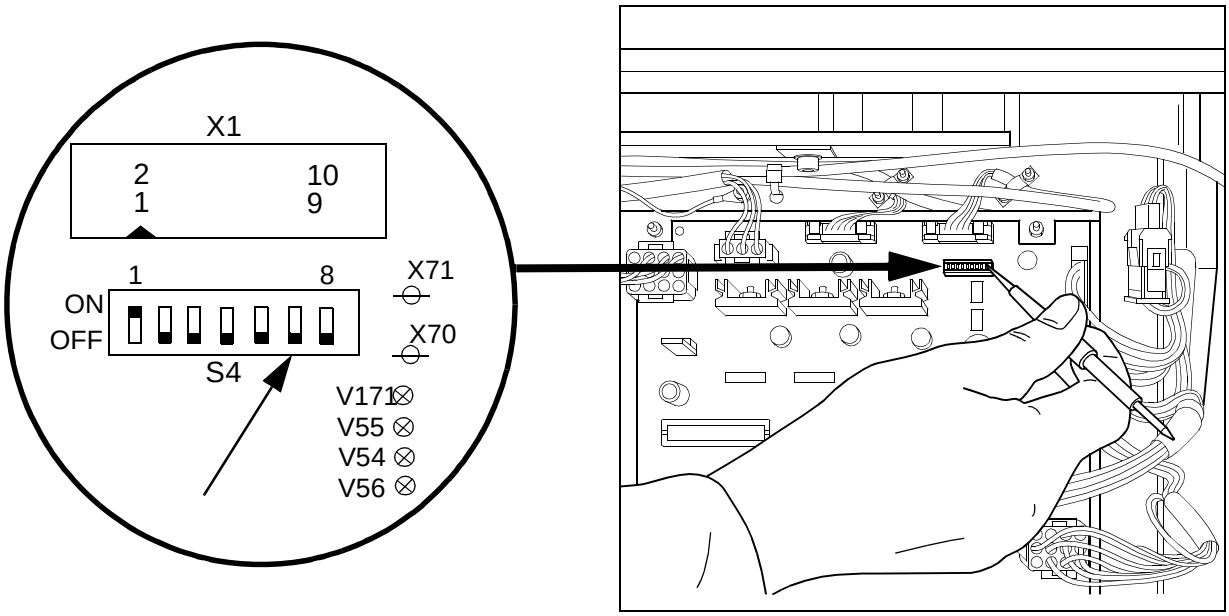


Fig. 1

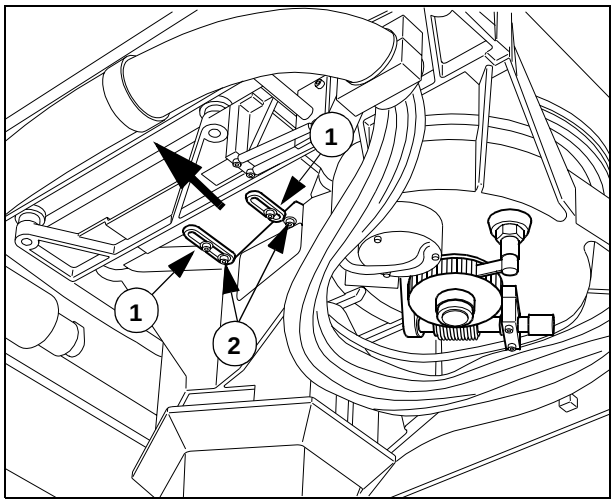


Fig. 2

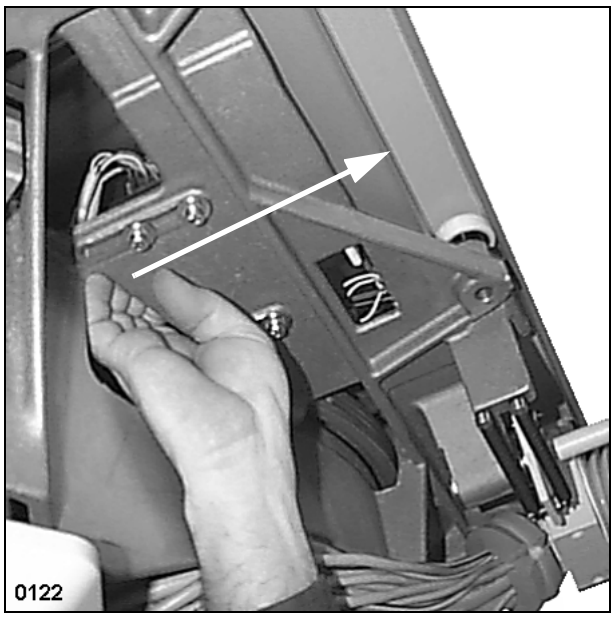


Fig. 3

Adjusting the Transverse Brake

- Switch on power.
- On the D13 (board sits on the side of the ceiling stand) set the S4.7 Dip switch (1/Fig. 1) to the up position.
  - LED V53 goes on.
- Loosen the 4 Allen screws on the brake assembly (1, 2/Fig. 2).
- Insert the adjustment strip (0.5 mm, 1/Fig. 4) between the brake unit and the rail for the transverse bridge, see Fig. 4.

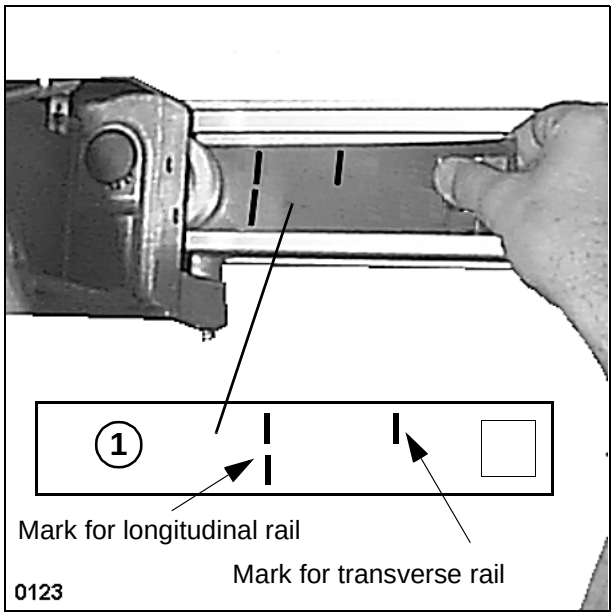


Fig. 4

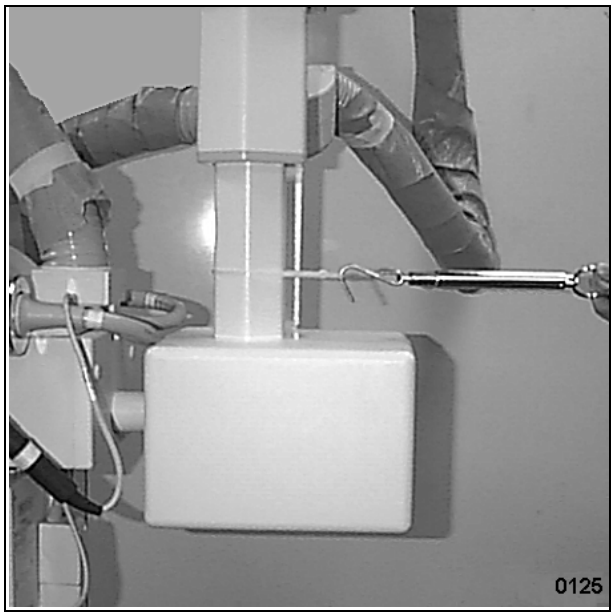


Fig. 5

- Slide the brake assembly up against the adjustment strip, see direction of arrow in Fig. 3, on the rail; when doing this, make sure that the brake lining surfaces are flat and even against the rail,.
- In this position, secure the brake assembly in position with the 4 Allen screws (1,2/Fig. 2).
  When doing this, first tighten the two mounting screws (1/Fig. 2) and then the screws (2/Fig. 2).
  A torque of **10 Nm** applies for all screws.
- Remove the adjustment strip; to do this, hold the strip and move the telescope carriage away.
- Set the S4.7 Dip switch on the D13 back to the down position.

Checking the Braking Force

- Use a spring balance to check the braking force; to do this, hook the spring balance onto the telescope as shown in Fig. 5.
  - The measured values should be between 120 N and 150 N.
- If the measured value is below 120 N, repeat the adjustment of the brake assembly.
  - In this case, the distance between brake and rail is too large. When readjusting, press the brake harder against the adjustment strip.

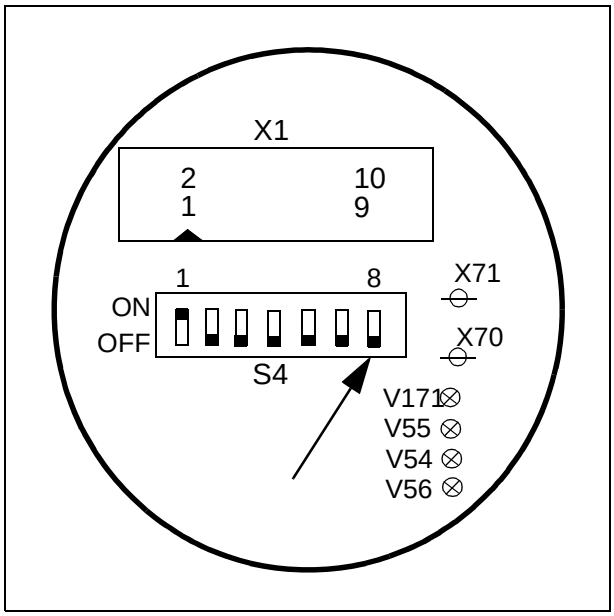


Fig. 6

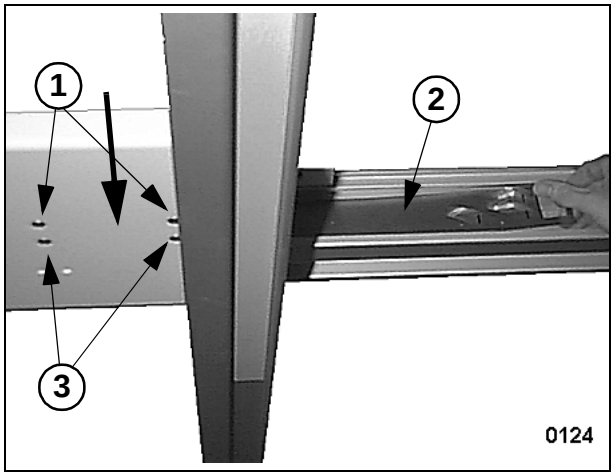


Fig. 7

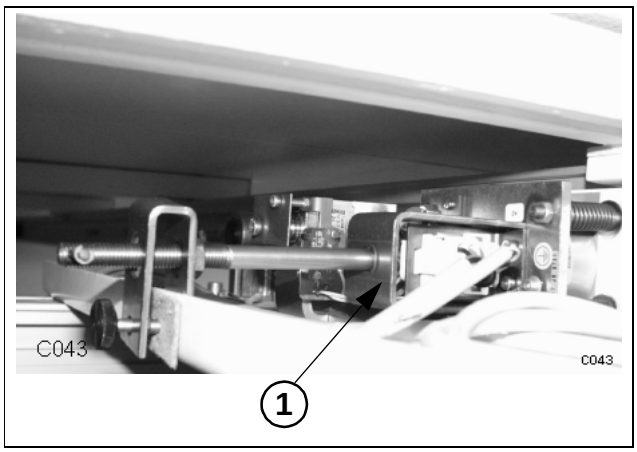


Fig. 8

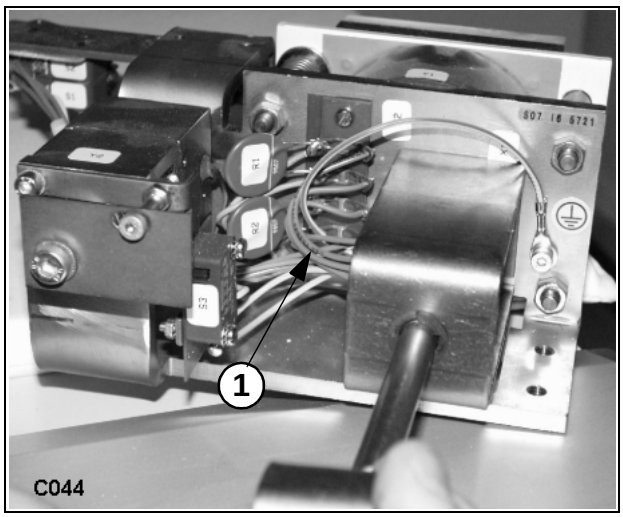


Fig. 9

Adjusting the Longitudinal Brake

- On the D13, set the S4.8 Dip switch (1/Fig. 6) to the up position.
  - LED V51 goes on.
- Loosen the 4 Allen screws on the brake assembly (1 and 3/Fig. 7).
- Insert the adjustment strip between the brake and the rail, see 2/Fig. 7.
- Press the brake by hand up against the longitudinal rail until the magnet audibly pulls in.
- Slide the brake assembly up against the adjustment strip, see direction of arrow in Fig. 7, against the rail; when doing so, make sure that the two brake lining surfaces are flat and even against the rail.

- Pre-tension the brake assembly with the tensioning aid (1/Fig. 8) as shown in Fig. 8; when doing this, make sure that a short-circuit does not occur on the soldering terminal (1/Fig. 9) and that no wires are damaged.
  - Pre-tension the brake assembly only so much to make is possible to still remove the feeler gauge.
- In this position, resecure the brake assembly by tightening the 4 Allen screws (1,3/Fig. 7). When doing this, first tighten the two mounting screws (1/Fig. 7) and then the screws (3/Fig. 7).

  !

  A torque of **10 Nm** applies for all screws.
- Remove the tensioning aid and feeler gauge, then deactivate the brake assembly.

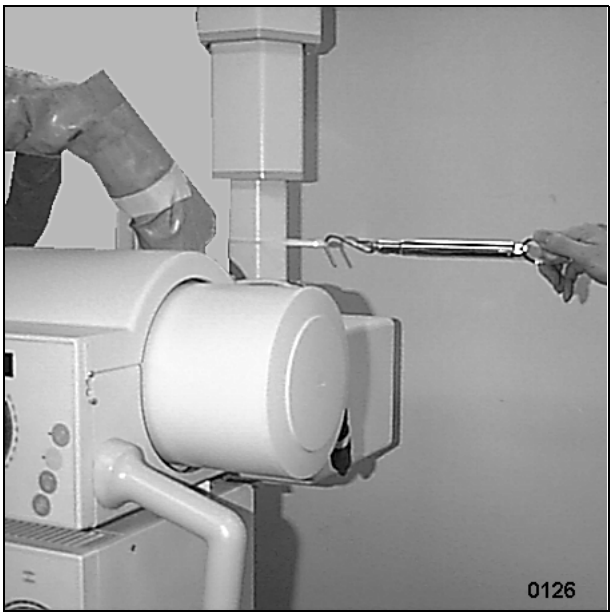


Fig. 10

Checking the Braking Force

- Use a spring balance to check the braking force; to do this, hook the spring balance onto the telescope as shown in Fig. 10.
  - The measured value should be between 120 N and 150 N.
- If the measured value is below 120 N, repeat the adjustment of the brake assembly.
  - In this case, the distance between the brake and the rail is too large. When performing the readjustment, press the brake harder against the adjustment strip.

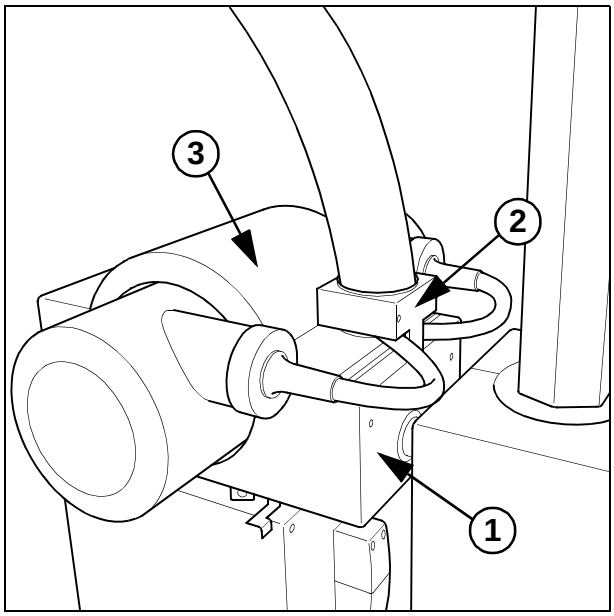


Fig. 11

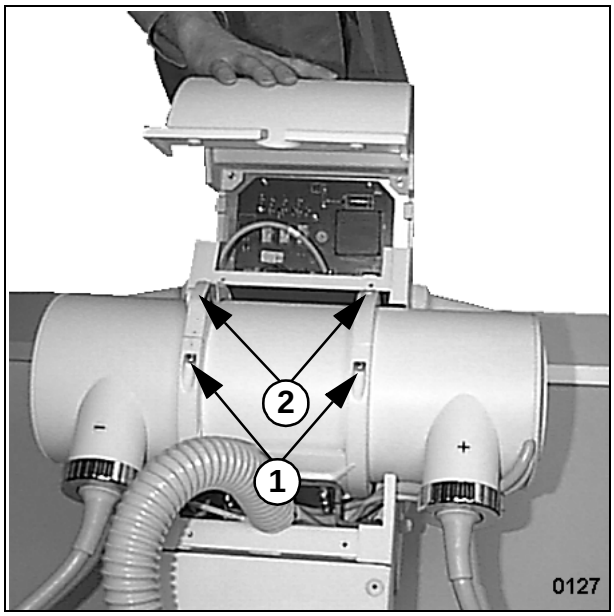


Fig. 12

Checking the Central Beam

The central beam has been adjusted at the factory. By using a brief check, make sure that the factory adjustment has not changed during transport, etc.

Adjustment in the Transverse Direction

- Set the tube unit vertically to the min. SID and switch on the light localizer.
- Mark the light field on the floor (collimator centering cross) in the longitudinal direction.
- Move the tube unit to the max. SID.
- The drift measured may not exceed 5 mm.

Correction (if necessary)

- Remove the cover panel (1/Fig. 11); two paneling screws, 32 mm.
- Remove the cable holder (2/Fig. 11); two M6x16 mm Allen screws.
- Remove the tube unit cover (3/Fig. 11), two 18 mm paneling screws.
- Loosen the two securing rings with the 2 Allen screws (1/Fig. 12).
- Loosen the 2 set screws (2/Fig. 12).
- Adjust the position of the tube unit around the longitudinal axis.
- Retighten the securing rings and the set screws.
- Reinstall the tube unit cover (3/Fig. 11), the cable holder (2/Fig. 11) and the cover panel (1/Fig. 11).

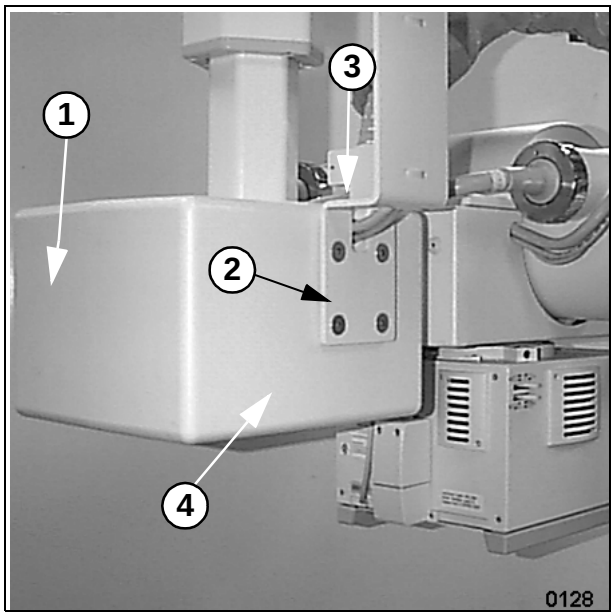


Fig. 13

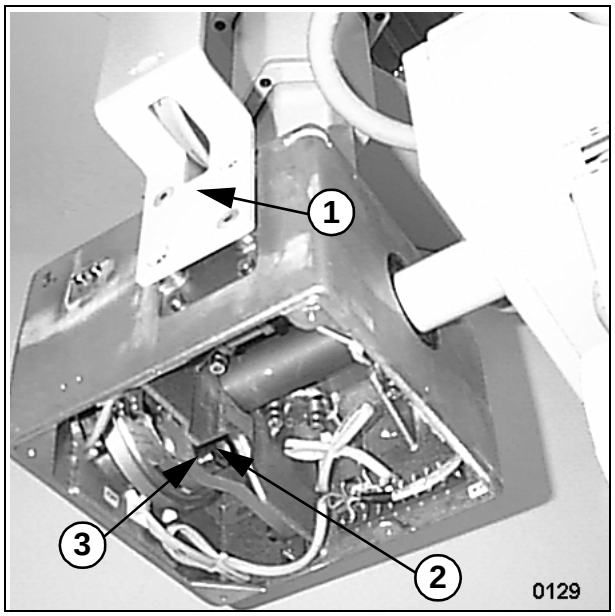


Fig. 14

Adjustment in the Longitudinal Direction

- Position the tube unit vertically to the min. SID and switch on the light localizer.
- Mark the light field on the floor (collimator centering cross) in the transverse direction.
- Move the tube unit to the max. SID.
- The drift measured may not exceed 5 mm.

Correction (if necessary)

- Remove the cover (1/Fig. 13).
- Remove the cable holder (2/Fig. 13).
- Remove the outlet piece (3/Fig. 13).
- Temporarily install the cable holder with 2 screws.
- Loosen the M6 screw (2/Fig. 14).
- Adjust the eccentric (3/Fig. 14); to do this, release the brake at the keyboard.
- Retighten the M6 screw (2/Fig. 14).
- Reinstall the covers, the outlet piece and the cable holder by following the above directions in reverse order.

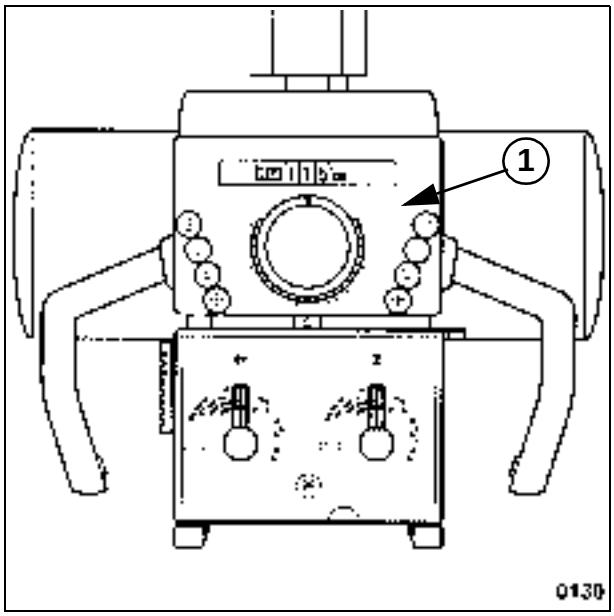


Fig. 15

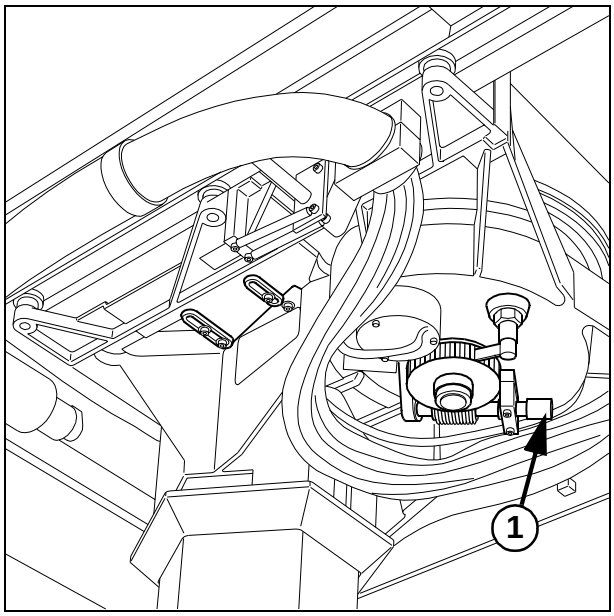


Fig. 16

Checking the Parallelism of the Central Beam to the MULTIX T OP Bucky

- Make a mark on the handgrip of the Bucky in the MULTIX TOP (use tape).
- Switch on the light localizer.
- Adjust the light localizer centering cross to the mark on the handgrip.
- Move the stand and the Bucky over the entire movement range of the Bucky and when doing so, determine the amount of drift in the longitudinal direction (tolerance: ≤ 5 mm).

Checking the Stand Movement

All the brakes in the following description should be released at the control unit (1/Fig. 15).

- Press the ↗ key.
  - The transverse brake must release.
  - The movement forces must be ≤ 30 N.
- Press the ↔ key.
  - The longitudinal brake must release.
  - The movement forces must be ≤ 30 N.
- Press the ↕ key.
  - The vertical brake must release.
  - Check for easy movement in the lift movement range (slight buoyancy in the user's working range is adjusted at the factory).
  - If needed, the weight compensation can be adjusted at the telescope extension spring (1/Fig.14) by turning the screw marked + and - .
- Press the ↷ key (DHA).
  - The rotation brake must release.

- The tube unit must engage in position in the vertical and horizontal beam direction. Rotation movement must be free between the stop positions (check for noises).

- Press the key (DVA).
  - The rotation brake around the telescope vertical axis must release.
  - Thee 90° stops must positively engage.

Checking the Table Movement

- Carry out the checks of the table movements per the MULTIX TOP User Instructions.
- The EMERGENCY STOP switch blocks all motorized movements.
  - To disengage the switch, turn it 1/4 turn to the right.

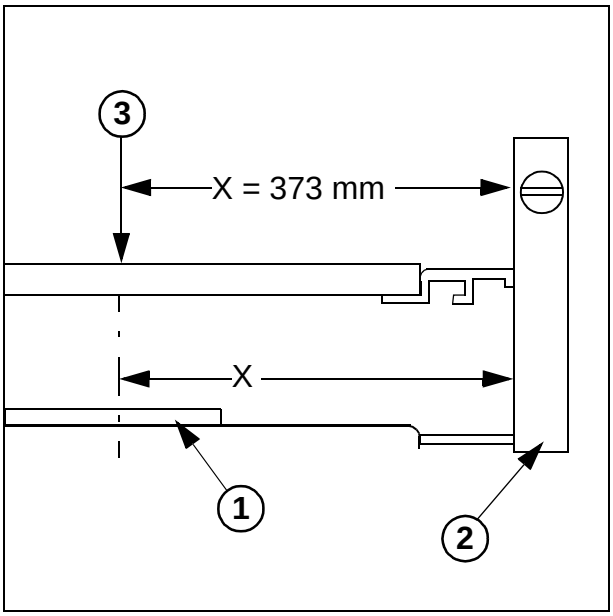


Fig. 17

Determining the Center of the Cassette on the Tabletop

- Switch on power.
- Insert a cassette into the MULTIX TOP catapult Bucky.
- Measure the distance (X/Fig. 17) from the center of the cassette to the end of the grip (required: 373 mm).
- Using a spirit level (2/Fig. 17) line up the end of the grip with the tabletop.
- Latch the tabletop in position.
- Transfer dimension X on the tabletop and mark it at (3/Fig. 17).
- Switch on the light localizer in the collimator and position the telescope to the center of the cassette in the transverse direction.

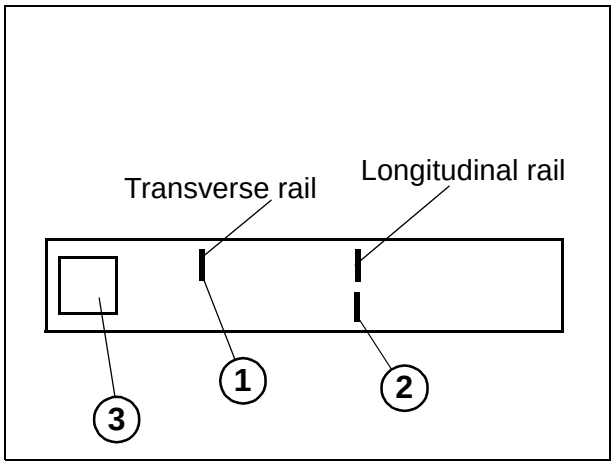


Fig. 18

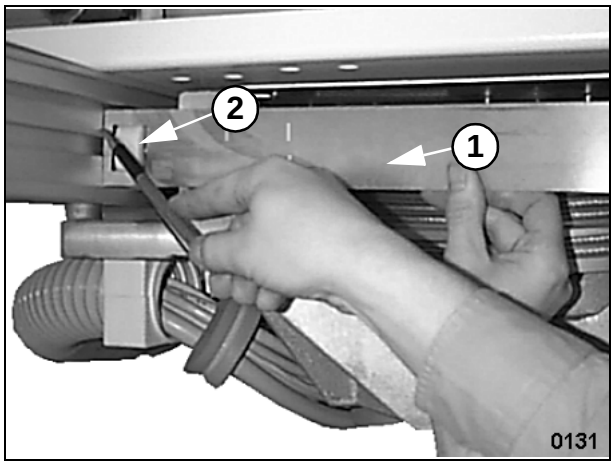


Fig. 19

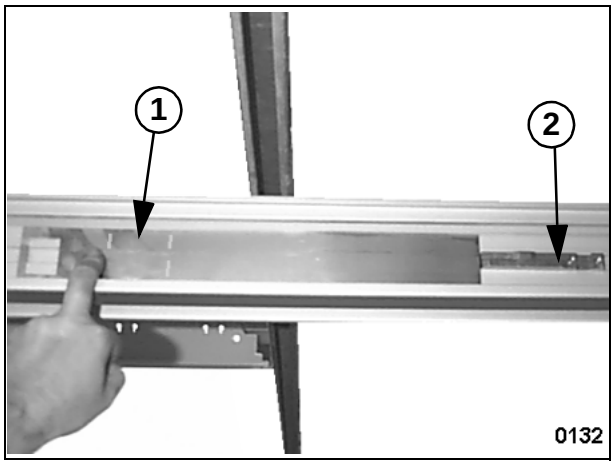


Fig. 20

Adjusting the Transverse Stop

NOTICE

The single slot (1/Fig. 18) in the template is used for adjustment of the table transverse direction, the double slot (2/Fig. 18) is used for adjustment of the table longitudinal direction.

The cutout (3/Fig. 18) is placed over the roller bearings for the telescope and the transverse bridge (adjustment of the middle position).

- Place the template (1/Fig. 19) at a right angle over the roller bearing of the telescope (2/Fig. 19).
- Use a pencil to make a mark on the rail, see Fig. 19.
- Move the telescope approx. 1 m to the side.

- Position the template as shown in Fig.18 in the rail, align the single slot (1/Fig. 18 and Fig. 20) and press the stop detent (2/Fig. 20) up against the template as shown in Fig. 20.

!

- Secure the stop detent in place with the two Allen-head set screws and tighten them to a torque of **10 Nm**.
- Remove the template.
- Move the telescope into the stop detent, press the key.
- Switch on the light localizer in the collimator.
- The light localizer must line up with the center mark on the tabletop, if needed, correct using the stop detent.

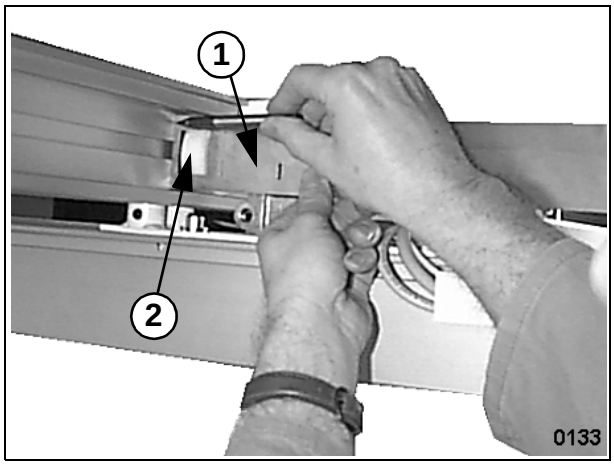


Fig. 21

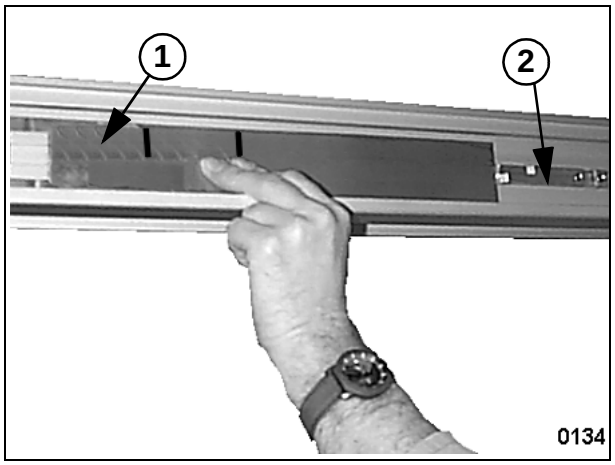


Fig. 22

Adjusting the Longitudinal Stop (Option)

- Move the Bucky into the mechanical middle position.
- Switch on the light localizer.
- Move the telescope longitudinally, press the ↔ key, and center it to the mark on the handgrip on the cassette tray.
- Place the template (1/Fig. 21) at a right angle over the roller bearing of the telescope (2/Fig. 21).
- Use a pencil to make a mark on the rail, see Fig. 21.
- Move the transverse carriage approx. 1 m to the side.
- Position the template in the rail as shown in Fig. 22, align the double slot (1/Fig. Fig. 18 and Fig. 22) and press the stop detent (2/Fig. 20) up against the template as shown in Fig. 22.

!

- Secure the stop detent in place using the two Allen-head set screws and tighten them to a torque of **10 Nm**.
- Remove the template.
- Move the telescope into the stop detent, press the ↔ key.
- Switch on the light localizer in the collimator.
- The light localizer must line up with the mark on the handrip of the cassette tray, if needed, correct using the stop detent.

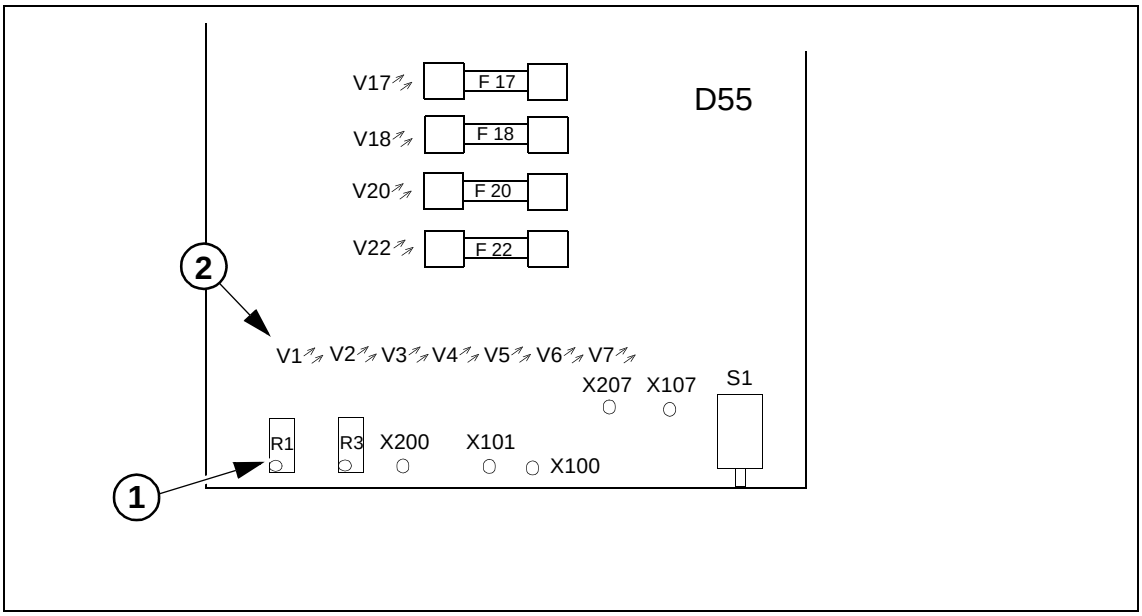


Fig. 23

Programming a Customer-specific Table Lift Stop Position

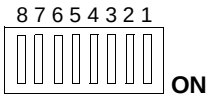
75 cm is set at the factory.

In discussion with the customer, it is possible to set an individual table lift stop position; e.g. to adapt to the existing bed height, etc. This position (working position) can be controlled automatically from below or from above.

- Move into the desired table lift position.
- Turn the R1 potentiometer (1/Fig. 23) until LED V1 (2/Fig. 23) goes on.
  - Direction of rotation ↷ ≙ table lift up
- Check the newly set table lift position by controlling movement from above and below.

Programming of the Table Key Types

DIL switch for the D55.S2 table brake



	Dead man's switch	Sensor mode	2s	4s	8s	6s	32s	64s
S2.1	OFF	ON	-	-	-	-	-	-
S2.2	n.a.	n.a.	-	-	-	-	-	-
S2.3	n.a.	n.a.	ON	OFF	OFF	OFF	OFF	OFF
S2.4	n.a.	n.a.	OFF	ON	OFF	OFF	OFF	OFF
S2.5	n.a.	n.a.	OFF	OFF	ON	OFF	OFF	OFF
S2.6	n.a.	n.a.	OFF	OFF	OFF	ON	OFF	OFF
S2.7	n.a.	n.a.	OFF	OFF	OFF	OFF	ON	OFF
S2.8	n.a.	n.a.	OFF	OFF	OFF	OFF	OFF	ON

beginning with Rev. 02

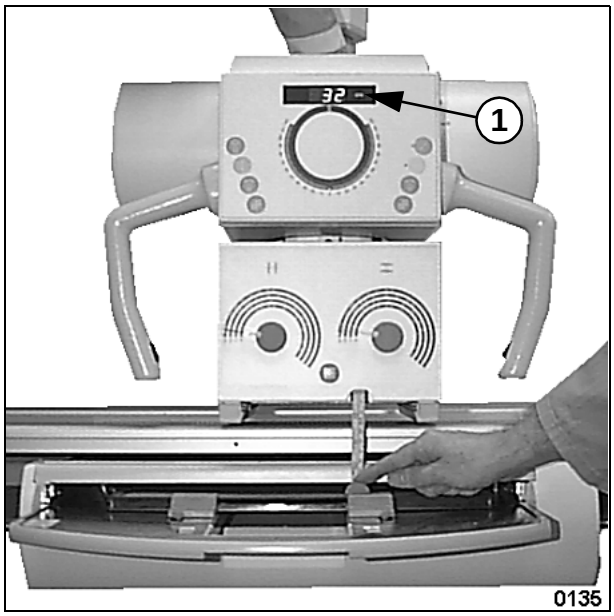


Fig. 24

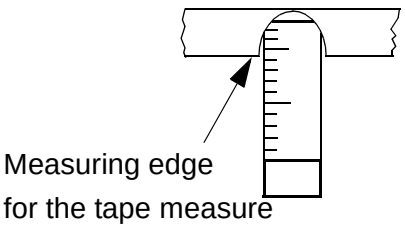
Fig. 25

Adjusting the SID Display

NOTICE

Position the tube unit for the following two SID adjustments so that "whole" cm values can be read on the tape measure because the display (1/Fig. 24) can only be read in whole cm steps.

- Select the MULTIX workstation at the generator.
- Move the table into the middle position.
- Insert a 35 x 43 cm in cassette into the cassette Bucky.
- Do not move the cassette Bucky all the way in.
- Move the 3D-TOP over the MULTIX table and position the tube unit just above the tabletop as shown in Fig. 24.
- Use the tape measure in the collimator to measure the distance to the top surface of the cassette and make a note of the value.



- Remove the cover panel (1/Fig. 25) on the command arm.
- Adjust the offset potentiometer (R1) through the opening (2/Fig. 25) so that the noted SID value appears on the display.

- Move the tube unit all the way up.
- Use the tape measure in the collimator to measure the distance to the top surface of the cassette and make a note of the value.
- Adjust the gain potentiometer (steepness, R2) through the lower opening (3/Fig. 25) so that the noted SID value appears in the display.
- Check the adjustment of the two SID values.
  - If there is a difference of ≥ 1 cm, repeat the adjustments.
- Move the table out of the middle position.
  -> The SID display on the command arm must go off; if this does not happen, plug in the D13.X16 1-2 jumper per the Wiring Diagram G6019 (3D TOP).

Checking the Vertical SID

NOTICE **The following adjustments must be recorded in the MULTIX TOP Test Certificate (Point 5.2).**

- Set an SID of 115 cm per the scale on the command arm and enter this value in the Test Protocol, Point 5.2 Bucky A (MULTI X table) “Displayed SID”.
- Use the tape measure in the collimator to measure the SID to the top surface of the cassette and enter the value in the Test Protocol under Point 5.2 Bucky A (MULTIX table) “measured SID”.
- Determine the difference between the two values and record it.
  - The SID difference may not exceed the values in the following table:

SID	Max. difference (corresponds to 1.5% of the SID)
100 cm	15 mm
115 cm	17 mm
150 cm	22 mm
36”	14 mm
40”	15 mm
48”	18 mm

- If the difference is greater, repeat the adjustment.
- Check off the box "Checked during Startup" in the Test Certificate, Point 5.2.

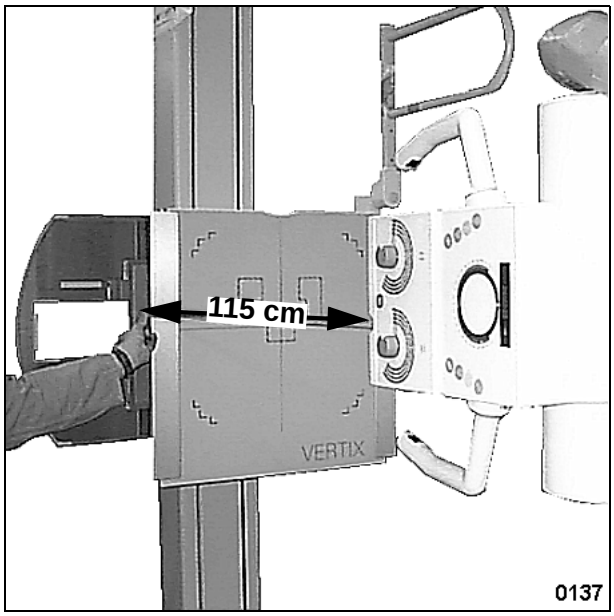


Fig. 26

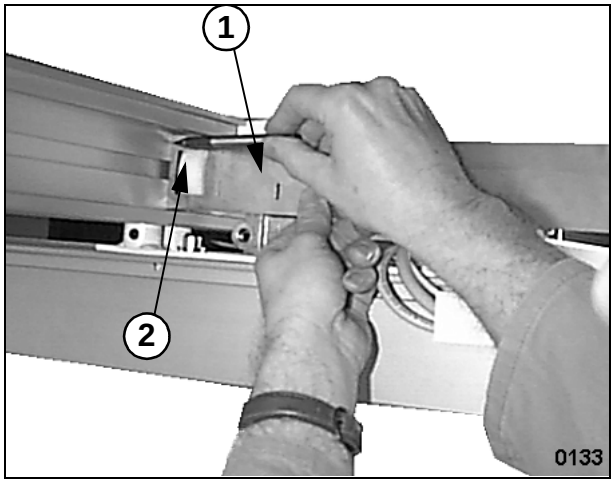


Fig. 27

Adjusting the Horizontal SID's to the Bucky Wall Stand (Option)

- Position the 3D-TOP ceiling stand to the Bucky wall stand as shown in Fig. 26.

NOTICE

If a Bucky wall stand is part of the system configuration, it should be installed per the supplied Installation Instructions.

Adjust the parallelism of the central beam during the installation per the Installation Instructions for the Bucky wall stand.

- Insert any cassette (e.g. 35 cm x 43 cm) into the cassette Bucky of the Bucky wall stand and do not insert the cassette tray all the way.
- Use the tape measure in the collimator to measure the first desired SID distance to the top surface of the cassette and set it (e.g. 115 cm).
- Place the template (1/Fig. 27) at a right angle over the roller bearing of the transverse carriage (2/Fig. 27).
- Use a pencil to make a mark on the rail, see Fig. 27.
- Move the transverse carriage approx. 1 m to the side.

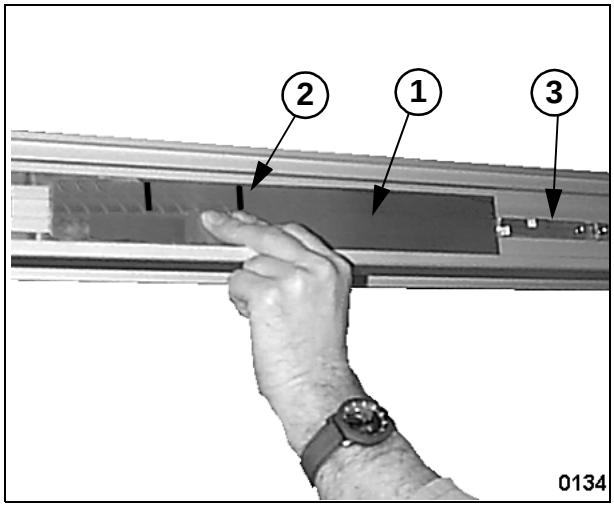


Fig. 28

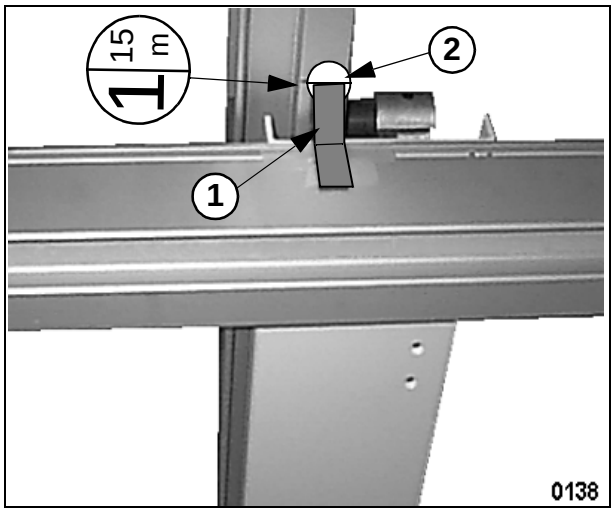


Fig. 29

!

- Position the template (1/Fig. 28) in the rail as shown in Fig. 28, align the double slot (2/Fig. 28) over the pencil mark and press the stop detent (3/Fig. 28) against the template as shown in Fig. 28.
- Secure the stop detent in place with the two Allen-head set screws and tighten them to a torque of **10 Nm**.
- Remove the template.
- Move the telescope into the stop detent, press the ↔ key.
- Check the SID several times using the tape measure.
- Place the red bracket (transverse bridge accessory pack, 1/Fig. 29) on the transverse bridge so that it is visible by the operator.
- Place the corresponding, self-adhesive SID label (2/Fig. 29) on the longitudinal rail. Align the edge of the red bracket with the line on the SID label, see Fig. 29.
- If wished, set additional SID's as described above.

Checking the SID's to the Bucky Wall Stand

NOTICE **Record the following settings in the MULTIX TOP Test Certificate (Point 5.3).**

Insert any cassette (e.g. 35 cm x 43 cm or 14"x17") into the cassette Bucky of the Bucky wall stand (do not insert the cassette all the way).

- Set the tube unit to the 1st SID mark on the longitudinal rail (1st stop position).

- Measure the SID using the tape measure in the collimator to the top surface of the cassette and enter the value in the Test Certificate under Point 5.3 Bucky B (Bucky wall stand) under FFA1/SID1.

- Determined the difference and record the value.
  - The SID difference may not exceed the values in the following table:

SID	Max. difference (corresponds to 1.5% of the SID)
100 cm	15 mm
115 cm	17 mm
150 cm	22 mm
200 cm	30 mm
300 cm	45 mm
36”	14 mm
40”	15 mm
48”	18 mm
72”	27 mm

- If the difference is greater, repeat the adjustment.

- Check the other SID' s to the Bucky wall stand in the same way as the 1st SID and record the results in the Test Certificate.

- Check off the box "Bucky wall stand configured" in the Test Certificate, Point 5.3 and "Checked during Startup".

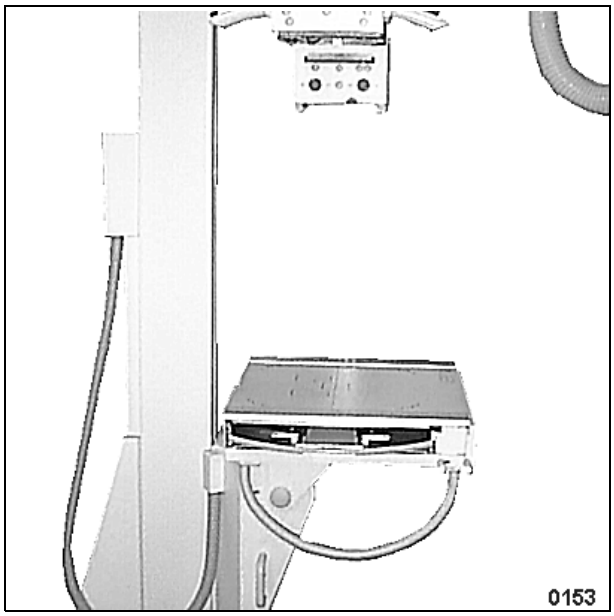


Fig. 30

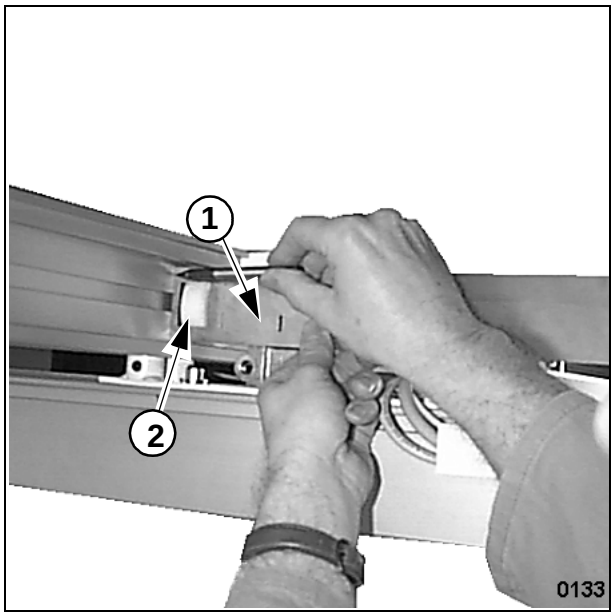


Fig. 31

Setting the Vertical SID and the Middle Position Stop in the Longitudinal and Transverse Directions to the Bucky Wall Stand (Option)

- Move the 3D TOP ceiling stand into the transverse stop to the Bucky wall stand and position it as shown in Fig. 30 above the Bucky wall stand that has been pivoted out.

Adjusting the Longitudinal Stop to the Bucky Wall Stand 90° (opened out)

With the Bucky wall stand, longitudinal:

- Switch on the light localizer.
- Move the telescope in the longitudinal direction, press the ↔ key, and center the mark on the handgrip of the cassette insert tray.
- Place the template (1/Fig. 31) at a right angle over the roller bearing of the telescope (2/Fig. 31).
- Use a pencil to make a mark on the rail, see Fig. 31.
- Move the transverse carriage approx. 1 m to the side.

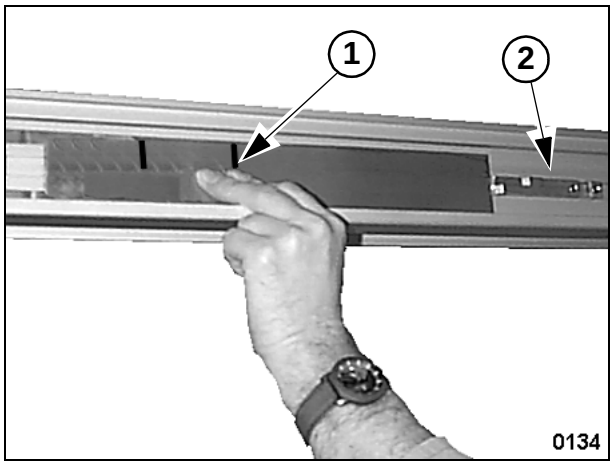


Fig. 32

- Position the template as shown in Fig. 32 in the rail, line up the double slot (1/Fig. 32) and slide the stop switch strike plate (2/Fig. 32) up against the template, Fig. 32.
- With the Bucky wall stand, transverse, proceed analogously to the adjustment of the SID stop detents.

!

- Secure the stop switch strike plate with the two Allen-head set screws and tighten them to a torque of **10 Nm**.
- Remove the template.
- Move the telescope into the stop.
- Switch on the light localizer on the collimator.
- The light localizer must line up with the mark on the handgrip on the cassette insert tray.

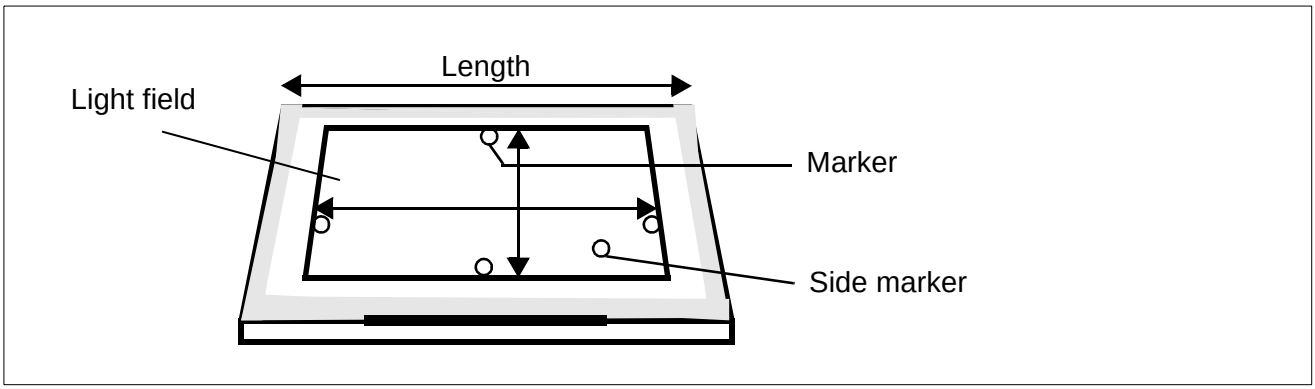


Fig. 33

Check of Light Field, Radiation Field and Format Collimation

- Position the central beam vertically.
- Place a 24 cm x 30 cm (10"x12”) cassette on the tabletop of the MULTIX TOP.
- Set a vertical SID of 115 cm.
  - Use the tape measure in the collimator to measure to the top surface of the cassette.
- Record this value in the Test Certificate under Section 2.1 "Coincidence of Light Field and Radiation Field”.
- Use the knobs in the collimator to **exactly** set a display of 18 cm x 24 cm or 8” x 10”, the exposure will also be used for the check of manual format collimation).
- Switch on the light localizer.
- Tape on a radio-opaque marker (e.g. washer, coin) on the cassette as shown in Fig. 33.
- Tape on a washer as a side marker.
- Trigger exposure: (■; 50 kV; 5 mAs) and develop the film.
- Use a waterproof felt-tip pen to note the following data on the developed film:
  - SID set
  - Focus size
  - Film size
  - Radiation field size

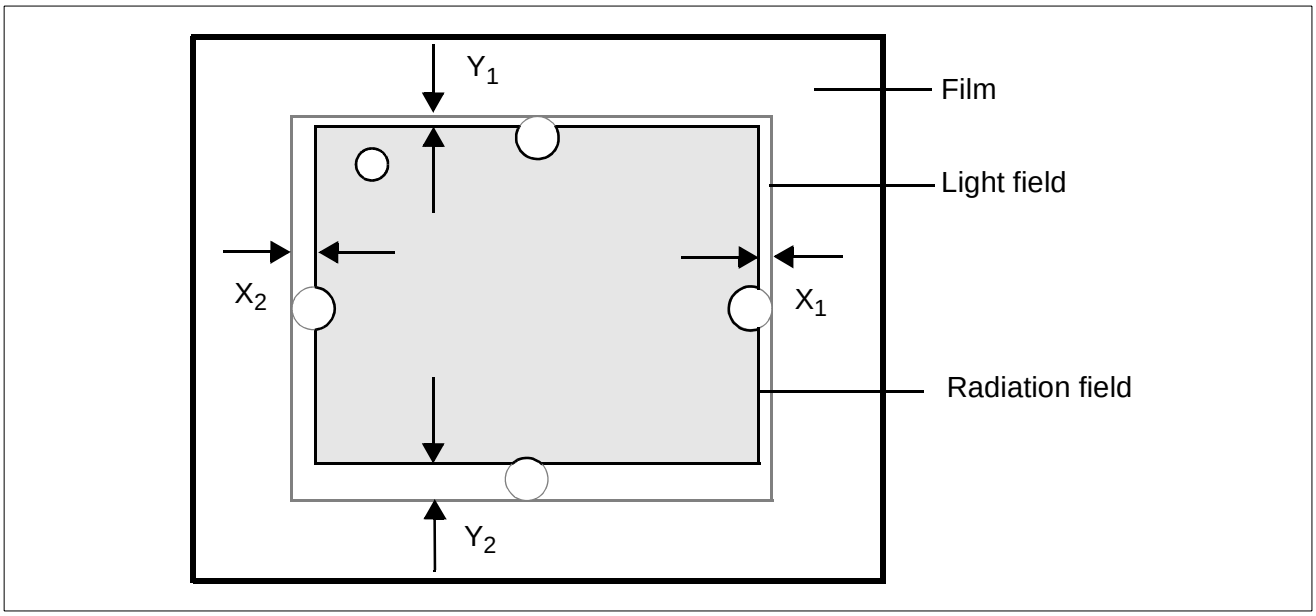


Fig. 34

Evaluation: Coincidence of Light Field to Radiation Field

- Measure the difference between the edges of the light field and the radiation field on all four sides (X1, X2, Y1, Y2) as shown in Fig. 34 and record the values in the Test Certificate under Point 2.1 “Coincidence of Light field and Radiation Field”.
- Calculate the overall difference in the X and Y directions (without regard to the mathematical sign in front).
  - The difference in width Σ Y and the difference in length X may not exceed 1.4 cm at a SID of 115 cm.
- In the Test Certificate, Point 2.1, check off the box "Checked during installation”.

Evaluation: Manual Format Collimation

- Record the width and length (18 cm x 24 cm or 8” x 10”) displayed on the collimator scale (115 cm SID) in the Test Certificate under 3.1 ”Accuracy of Manual Format Collimation”.
- Measure the width and length of the radiation field and record this in the Test Certificate.
- Calculate the difference between the radiation field size and the width and length of the set format and record the values.
  - The difference in both directions (length and width) may not exceed 1.4 cm in either direction.
- In the Test Certificate, Point 2.1, check off the box “Checked during startup”.

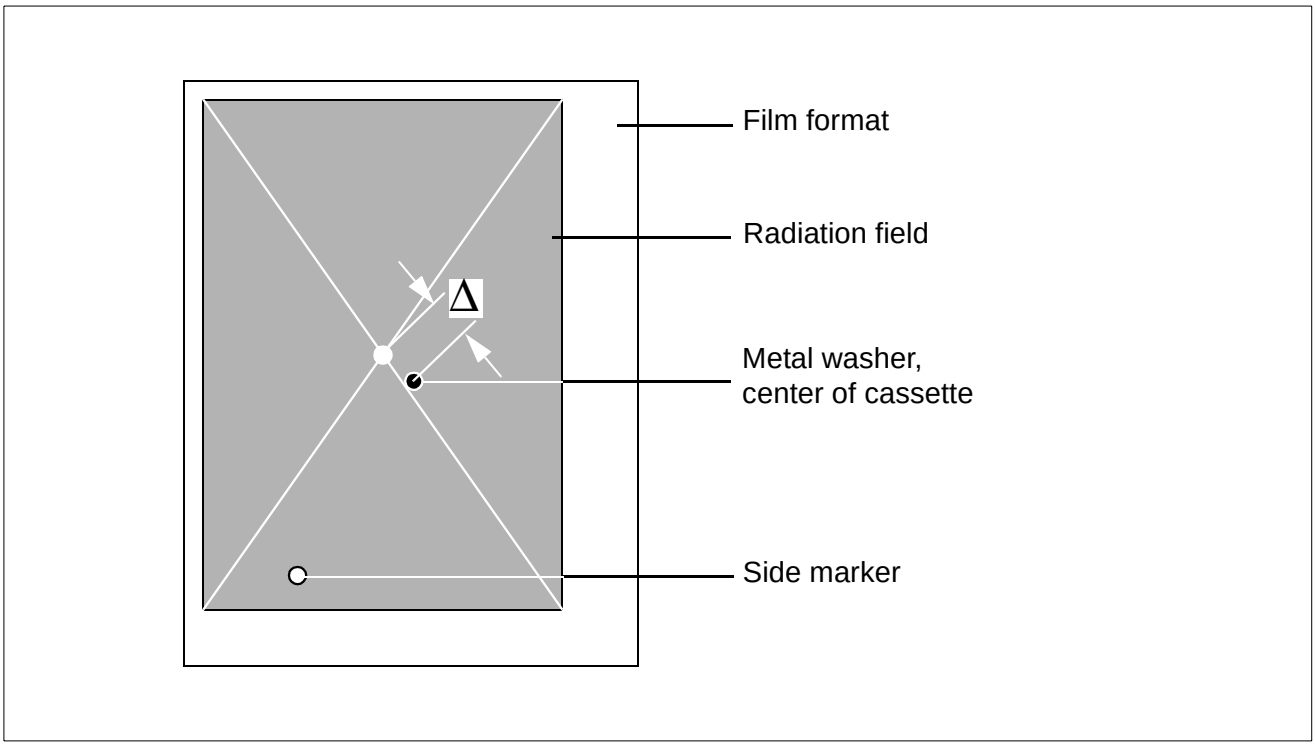


Fig. 35

Coincidence of Radiation Field and Center of Film (Bucky A)

Procedure:

- Position the central beam vertically, center the tube unit on the cassette tray marker and set an SID of 115 cm.
- Move the tube unit in the transverse direction into the middle position stop.
- Place a center marker on a 24 cm x 30 cm (10”x12”) cassette (tape on a metal washer) and tape on a second marker as a side marker (Fig. 35).
- Load the marked cassette with film, insert it into the cassette tray and insert the tray all the way in to the stop.
- Using the knobs on the collimator, set a format of 18 cm x 24 cm (8” x 10”) per the scale (SID = 115 cm).
- Trigger exposure (■; 50 kV; 5 mAs) and develop the film.

Evaluation:

- Evaluate the difference from the center Δ as shown in Fig. 35 and record this value in the Test Certificate, Point 4.2 “Checked during startup” (Coincident of radiation field center and film center, Bucky A).
  - The difference may not exceed 12 mm at an SID of 115 cm.
- In the Test Certificate, Point 4.2, check off the box “Checked during startup”.

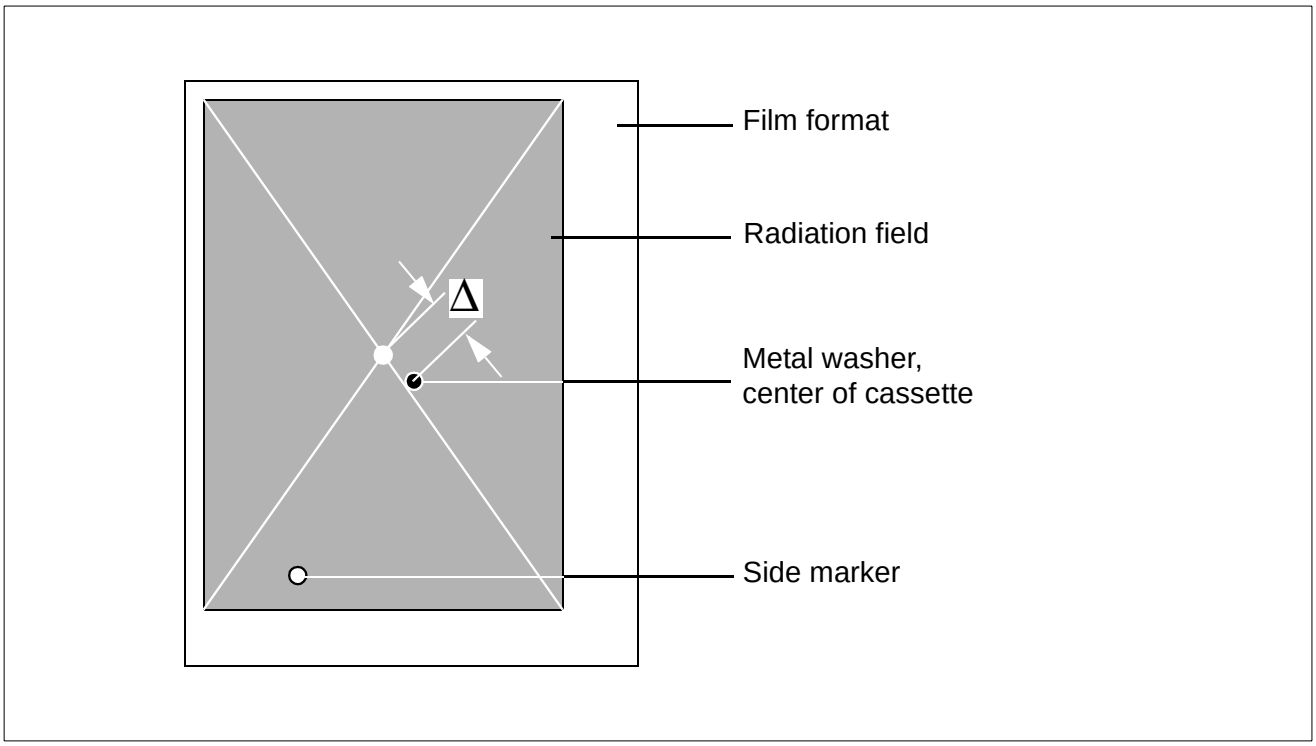


Fig. 36

Coincidence of Radiation Field and Center of Film (Bucky B)

Bucky Wall Stand (Option)

a) Horizontal Beam Direction

Procedure:

- Position the tube unit in the horizontal beam direction to the Bucky wall stand, center it to the cassette tray marker and to the minimum SID.
- Record the SID in the Test Certificate under Point 4.3.
- Place a center marker on a 24 cm x 30 cm (10”x12”) cassette (tape on a metal washer) and tape on a second washer as a side marker (Fig. 36).
- Load the marked cassette with film, insert it into the cassette tray and insert the tray all the way in to the stop.
- Using the knobs on the collimator, set a format of18 cm x 24 cm (8” x 10”) per the SID scale.
- Trigger exposure (■; 50 kV; 5 mAs) and develop the film.

Evaluation:

- Determine the amount of difference from the center Δ as shown in Fig. 36 and record this value in the Test Certificate, Point 4.3 “Checked during startup” (Coincidence of Center of Radiation Field and Center of Film, Bucky B).

- The difference may not exceed the following values:

SID	Max. difference (corresponds to 1.0% of the SID)
100 cm	10 mm
115 cm	11.5 mm
150 cm	15 mm
200 cm	20 mm
300 cm	30 mm
36”	0.91 cm
40”	1.01 cm
48”	1.21 cm
72”	1.82 cm

- In the Test Certificate, Point 4.3, check off the boxes “Bucky wall stand configured” and “Checked during startup”.

b) Vertical Beam Direction (only with the 90° Bucky wall stand)

Preparation:

- Mark the center of the cassette with a cassette size of 24 cm x 30 cm or 10” x 12” by taping on a washer and use a second washer as a side marker.

Procedure:

- Pivot the tube assembly into the vertical beam direction.
- Swing out the Bucky wall stand (90°).
- Center the tube unit to the Bucky wall stand (move longitudinally and transversely into the stop detents).
- Set an SID of 115 cm or 40" and enter this value in the Test Protocol, Point 4.3 - Bucky wall stand, vertical beam direction.
- Insert a 24 cm x 30 cm or 10” x 12” cassette with center marker in the cassette tray and insert the tray all the way to stop.
- Use the knobs on the collimator to set the 18 cm x 24 cm or 8” x 10” format.
- Trigger exposure (■; 50 KV; 4 mAs).
- Develop the film, determine the center of the radiation field and evaluate the film as shown in Fig. 36.

Result:

- The max. center difference, Δ , may not exceed 1.0% of the SID and enter the value in the Test Protocol, Point 4.3 - Bucky wall stand, Vertical Beam Direction.
- The max. center difference, Δ , may not exceed the following values.

SID	**max. Difference** (corresponds to 1.0% of the SID)
1.15 m	1.15 cm
40”	1.01 cm

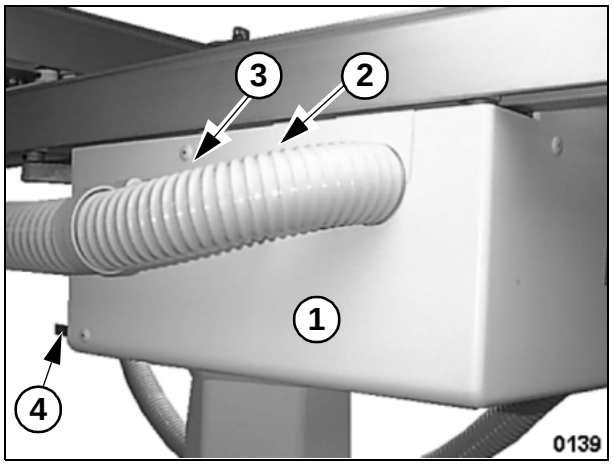


Fig. 37

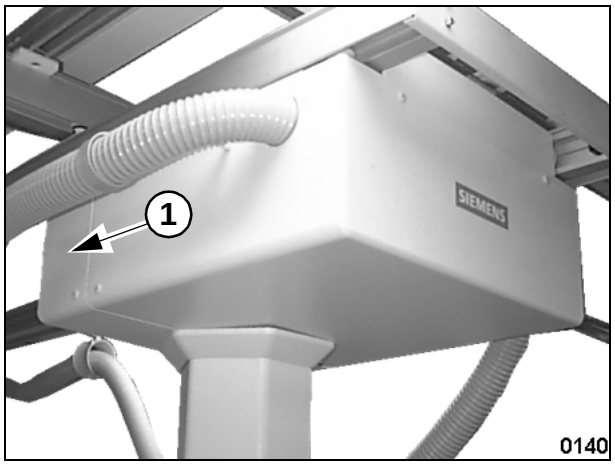


Fig. 38

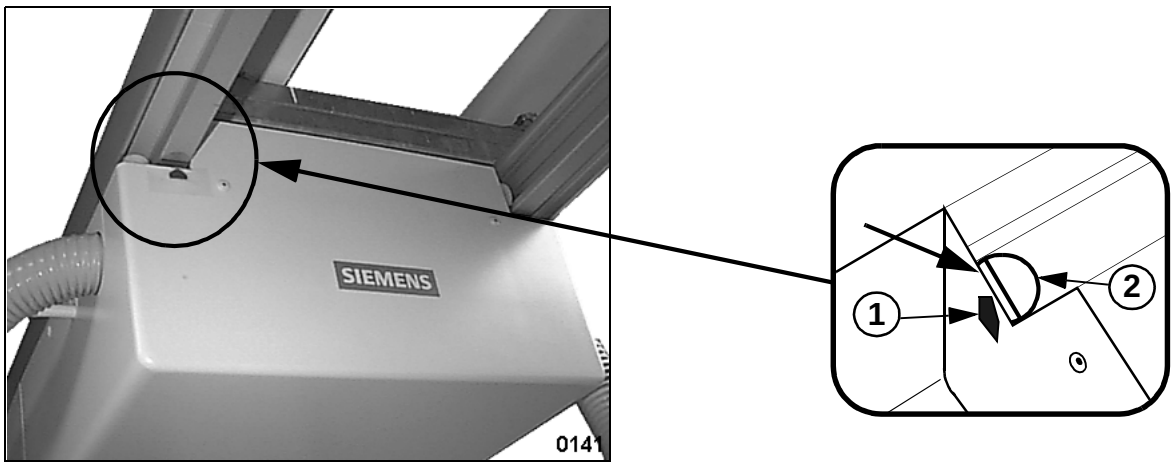


Fig. 39

Installing the Telescope Cover Panels

- Install the front telescope cover panel (1/Fig. 37) (M4x18mm paneling screws).
- Place the cover panel over the corrugated hose outlet (2/Fig. 37) on both sides of the cover.
- Install the cover panel over the corrugated hose outlet (3/Fig. 37).
- Place the connector piece (4/Fig. 37) on both sides of the cover panel (M4x18mm paneling screws).
- Install the rear cover panel (1/Fig. 38) (M4x16 paneling screws).
- Move the telescope in the transverse direction into the middle position stop.

Placing on the Label for the Middle Position

- Place the red self-adhesive arrow (1/Fig. 39) on the telescope cover panel.
- Place the label (2/Fig. 39) on the transverse rail. When doing so, line up the line on the label with the edge of the cover panel (arrow /Fig. 39).

Checking the IONTOMAT

- Perform the check of the IONTOMAT per the supplied Startup Instructions for the particular generator

  POLYDOROS SX 65/80, LX 30/50 Lite, LX 80 RX63-020.034.18...

  System Configuration with the Service PC for POLYDOROS LX 30/50, POLYDOROS LX 30/50 Lite and POLYDOROS SX 65/80, POLYDOROS LX 80 RX63-020.034.21...

per the chapter “Startup and Function Check” and record the results in the Test Certificate for Direct Exposure Equipment, RXD0-000.037.05....

- After the check of the IONTOMAT has been completed, continue with the following section in these instructions.

Checking the Diamentor

If a Diamentor is installed, carry out the check per the supplied Startup Instructions.

With an external Diamentor, carry out the check per the manufacturer’s instructions.

After the check of the Diamentor has been completed, continue with the following section in these instructions.

Checking Grid Blurring

A check must be performed for every application unit with a moveable grid to determine at which exposure time t_g grid stripes are no longer visible on the film.

Procedure

- At the generator, select small focus, 80%, 40 kV and the middle IONTOMAT chamber.
- Set an SID of 115 cm.
- Insert a 18 cm x 24cm cassette without film.
- Trigger exposure beginning at 40 kV until an exposure time of approx. 3 ms results (increasing the kV value -> exposure time becomes smaller).
- Insert a 18 cm x 24cm cassette with film.
- Trigger an exposure using the previously determined kV value.
- Using a magnifier at the light box, determine at which switch time grid stripes no longer can be detected on the film.
- Record the switch time in Chapter 8 of the “Test Certificate for Direct Exposure Equipment”, RXD0-000.037.05... for the particular device.
  - Grid stripes at exposure times of ≥ 3 ms are not admissible.

NOTICE

At the factory, the lead time is set in the range between 36-42 ms. If despite this grid stripes are visible, the lead time must be changed as described in the section “Adaptation to the Generator Lead Time”.

Generator Table

Adapting to the Generator Lead Time

The lead time can be set using DIP switches S3.1 to S3.8 on the D30 board in the catapult Bucky; see also the Catapult Bucky Wiring Diagram G051G, Page 2A-2.

The programming of the S3.2 switch position depends on the installed grid:

S3.2 ON = 70-Line grid

S3.2 OFF = 40-Line grid

Generators with 24V KK Connection	Lead Time
ORGANOMATIC 506/706	48 - 54 ms
TRIDOROS 1012 MP	48 - 54 ms
GARANTIX 800	48 - 54 ms
TRIDOROS-OPTIMATIC 800/1000	48 - 54 ms
GIGANTOS-OPTIMATIC	48 - 54 ms
POLYPHOS 30/30E/30W	48 - 54 ms
TRIDOROS 512MP / 712MP	48 - 54 ms
POLYDOROS 50/80	48 - 54 ms
POLYDOROS 50/80S	48 - 54 ms
POLYMAT 50	48 - 54 ms
POLYMAT 70	48 - 54 ms
POLYDOROS SX 50/80	48 - 54 ms
POLYDOROS LX	36 - 42 ms
POLYDOROS LITE	36 - 42 ms
POLYDOROS SX 65/80	36 - 42 ms

Measurement of Ground Wire Resistance

(must be completed as the last step).

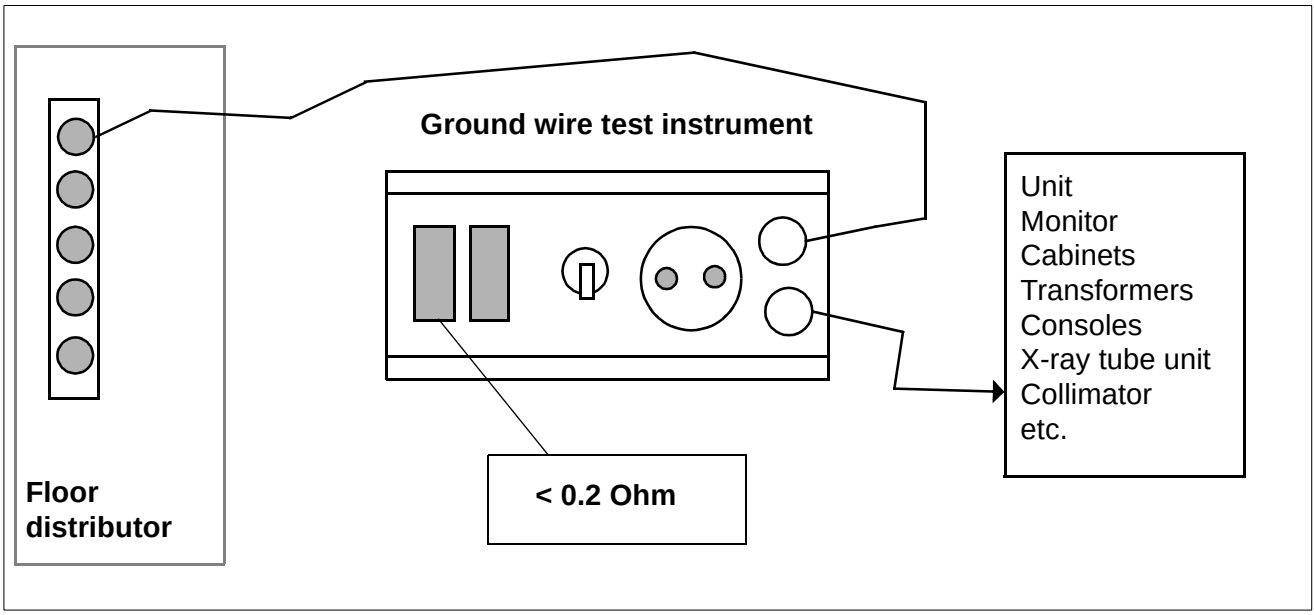


Fig. 40

Test unit:	Ground wire test instrument
Measurement value:	max. 0.2 Ohm (observe national regulations), (current: 10 A, voltage drop max. 2 V)
Test procedure:	Measure between all conductible parts of the system that can be touched and the ground wire rail in the floor distributor. Exception: accessory rails and tabletop.
Conditions:	**Ground wire resistance, max. 0.2 Ohm.**

- If this value is greater, increase the ground wire cross section.
- Lower the transfer resistance (e.g. tighten the screws).

CAUTION

After completing all adjustment steps and control measurements, the responsible technician must confirm in the Test Certificates (Unit, Generator, and IQ Test Certificate for Direct Exposure Equipment) that all values have been correctly determined and recorded, and must sign and date it.

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Cover Page:

Changed.

Chapter 1; Pages 1 and 2:

Measuring equipment table expanded and notices changed.

Chapter 3; Pages 3 and 4:

Paragraph: Adjusting the Longitudinal Brake changed..

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